

# Industrial Minerals in Pennsylvania in 1951

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**T**HE purpose of this summary is to relate some of the significant trends and developments during 1951 in the widely diversified field of industrial mineral production in Pennsylvania. Production statistics are not yet assembled for the year.

It is recognized that the summary is not all-inclusive but most of the more important features are included as a result of the coöperative spirit among men in industry who were requested to supply data.<sup>1</sup>

Accelerated industrial activity and an increase in large housing projects, both reflecting the current defense program, and a continuing high rate of highway construction and repair, have resulted in a high level of industrial mineral production. Most significant were the numerous developments in the stone industry of the state.

## Stone

With the construction of the new Fairless works at Morrisville and other new or expanded steel-making facilities in the Middle Atlantic area, an unprecedented demand for fluxstone is anticipated. Geological field parties of several major steel companies were engaged in prospecting for additional reserves of fluxstone in southeastern Pennsylvania.

The demand for commercial crushed stone was up 10 per cent in 1951 over 1950, due largely to needs for housing development projects. Some decline in production of commercial crushed stone is anticipated in 1952. Agricultural limestone production held the 1950 level during 1951, but a 10 per cent increase is anticipated for the coming year. Following are listed the more important developments in 1951 on the part of individual companies:

### NEW MAJOR OPERATIONS

*Standard Lime and Stone Co.*, Pleasant Gap, Centre Co.

An underground mine and preparation plant with a capacity of 250-275 tons per hour is expected to go into production about March 1. The mine is in the high-calcium limestone of the Bellefonte ledge. Initially the entire output of the plant will be fluxstone, but later agricultural stone may be produced.

*Bradford Hills Quarry, Inc.*, near Downingtown.

This quarry is expected to produce about 500,000 tons of commercial crushed stone annually from an impure limestone bed.

*J. B. Morrissey*, Eureka, Montgomery Co.

Small quarry is being expanded to produce one-half million tons of commercial crushed stone annually. The quarry is in metamorphic rock.

<sup>1</sup> Gratefully appreciated is the coöperation of the following persons in supplying data for this summary: E. T. Andrews, Pennsylvania Glass Sand Corp.; R. T. Birch, Harbison-Walker Co.; J. C. Brown, Lehigh Portland Cement Co.; A. E. Fitzgerald, General Refractories Co.; E. N. Funkhouser, Funkhouser Co.; T. C. McPoyle, John T. Dyer Co.; H. H. Miller, Sand & Gravel Assoc.; W. F. Mullen, School of Mineral Industries, Pennsylvania State College; and H. Wagner, Penna. Stone Producers Assoc.

## MAJOR EXPANSIONS

*H. E. Millard Lime & Stone Co.* is expanding its Palmyra operation in Annville high-calcium limestone district to produce an additional 300 tons of fluxstone each day.

*Whiterock Quarries, Inc.*, Pleasant Gap, Centre Co.

Has doubled its output of fluxstone which presently moves to the Pittsburgh area.

*G. & W. H. Corson, Inc.*, Plymouth Meeting, Montgomery Co.

This operation is expected to produce an additional 150,000 tons of dolomite fluxstone annually.

The Annville Stone Co., operating an open pit and underground mine in the high-calcium Annville belt near Hershey, was acquired by the Michigan Limestone and Chemical Co., a subsidiary of the U. S. Steel Co., and the property is expected to supply in part the fluxstone requirements of the Fairless works. In addition to the larger operations listed above, there were a number of new or expanded smaller stone-producing quarries, among which are Gloster Brothers, Montgomeryville, Chambersburg Stone Co., and Samuel Glasgow, Glenside, each expecting to produce about 250,000 tons per year.

The stone industry in Pennsylvania spent approximately \$2,000,000 during 1951 on installation of impact crushing equipment and improved screens to control the shape of crushed particles and overcome unfavorably high percentages of "flats" in commercial crushed stone, particularly in that stone used for highway construction.

The recently developed dry rotary drilling machines, using tri-cone bits similar to those commonly used in the oil industry, were employed for the first time in at least three Pennsylvania quarries. Experience has shown that a dry rotary drill can perform the work of about five conventional cable-tool churn drills, which they replace, and give a straighter, smoother hole for blasting.

The Pennsylvania Topographic and Geologic Survey continued work on limestones. Carlyle Gray extended his mapping westward from Berks County into Lebanon County, where he mapped the high-calcium limestone belt of the Annville district. Professor C. E. Prouty, coöperating geologist on the Survey staff from the University of Pittsburgh, extended his stratigraphic studies of the limestones of central Pennsylvania. One report was published, "*Certain Limestones and Dolomites in Berks County, Pennsylvania*," by Carlyle Gray, Pa. Geol. Survey, 4th Series, Progress Report 136.

## Slate

Slate markets continued to be highly competitive in 1951 but there was a marked increase in the sale of bulletin boards and toy slates. A heavy windstorm in the East in late 1950 resulted in much roof damage and led to a large backlog of orders for roofing slate during 1951.

In a new type of slate roof developed for ranch-type homes, the slates are attached using a mastic base cement rather than the conventional nailed-on shingle.

Two companies merged during 1951 and one completed a new mill. Another company is constructing a new mill to process the output of a

new quarry. One operator plans complete modernization of a roofing slate mill, utilizing a belt conveyor system for handling the slate during processing.

The Pennsylvania Slate Producers Guild, a coöperative trade association, was organized in July 1951 to carry out a program of advertising, promotion and sales engineering.

Pennsylvania State College continued its studies of problems pertinent to the slate industry. Results of a highly informative investigation were published in "*Operational Studies of Pennsylvania Slate Production*," by C. W. Stickler, W. F. Mullen, and A. Wayne Bitner, Mineral Industries Experiment Station Bulletin 58.

### Cement

With unprecedented demands for cement throughout the United States, the large Pennsylvania cement industry operated at practically full capacity during 1951. Expansion of the industry is being retarded by the uncertainty of the legality of the right of the seller to meet lower competitive prices through base-point pricing. A bill to clarify the right to meet competitive prices, passed by the last Congress, was vetoed by the President, but it is hoped that a new bill will receive favorable action early in 1952. The Pennsylvania cement industry, because of its large productive capacity, is forced to market over a wide area, hence the right to meet competition is vital to the future of the industry.

During 1951 the Pennsylvania-Dixie Cement Company rehabilitated its West Winfield plant, formerly owned by the West Penn Cement Co., the only major development of the year.

Availability of ideal raw materials situated close to the largest market area in the country was the prime factor leading to the development of a cement industry second to none in the Lehigh-Northampton County area. Depletion of these resources is of vital concern in the district today. Companies are being forced to shift from quarrying to underground mining of the high-grade raw materials, or to install equipment to beneficiate lower grades of stone more readily available. The problem of raw material reserves is further complicated by the competition from companies acquiring limestone properties to supply fluxstone to the rapidly expanding steel industry in the Middle Atlantic area.

The critical problem of dwindling reserves of high-grade raw material facing the cement industry, underscores the need for continuing the geologic mapping and laboratory studies of the geologically complex cement belt. The work in Berks County by Carlyle Gray, of the Survey staff, referred to under the discussion of the stone industry, provides much basic information vital to this specific problem.

### Lightweight Aggregates

Utilization of lightweight aggregates in the building trades continues to increase though the immediate future of the industry is obscured by current defense restrictions. In Pennsylvania, lightweight aggregates are produced in one plant by expanding anthracite coal wastes and in three other plants by expanding blast furnace slag.

Expanded aggregates such as foamed slag and bloated coal waste have an average range in weight from 40 to 60 pounds per cubic foot as compared to 100 pounds or over for most crushed stone, sand and gravel. The use of lightweight aggregates can thus materially reduce the dead weight in a building. These aggregates are widely used for lightweight precast masonry units, and they may also be used for reinforced and structural concrete construction with appreciable savings in critical structural steel.

Production in the lightweight aggregate industry was up in 1951, although one operator reported a slight decline in movement of material to the concrete block trade. Much of the lightweight aggregate produced moves to the metropolitan areas. During 1951 there was one major plant expansion in the industry—the Waylite Company doubled the capacity of its slag expanding operation at Bethlehem through the construction of a new production unit. One large ready-mix concrete producer in southeastern Pennsylvania continued experimental work on the bloating of shales.

In addition to the production of lightweight aggregates for use in concrete, as discussed above, there are two plants in the state that expand perlite, a glassy volcanic rock, to produce an aggregate of even lighter weight but lower strength, which is particularly suited to use in plaster. The raw perlite is imported from the western United States. Perlitic rocks are known to occur in the volcanic core area of South Mountain in Adams County, Pennsylvania, but these geologically old perlites have lost their expanding quality through devitrification.

## Refractories

There were several developments in the refractory industry during 1951 worthy of note. Most important perhaps is the construction of a new silica brick plant by the General Refractories Company at Morrisville on the site of the Fairless steel works. At Mt. Union the Harbison Walker Company made extensive improvements in crushing and grinding equipment to further improve the washing plant that was installed several years ago to up-grade raw material for silica brick production. This plant pioneered in the beneficiation of silica for refractory brick. At Clearfield the same company, in expanding one of its fire brick plants, installed the first rotary kiln for calcination of clay.

Reports of concern among the refractories companies over dwindling reserves of better grades of flint clay emphasizes the growing need for a long-range program of detailed geologic mapping of clay resources. One such project by John H. Weitz and Robert C. Bolger of the Survey staff on the high-alumina clays of the northcentral plateau area is nearing completion.

## Glass Sand

The Oriskany formation in Pennsylvania continued to be one of the most important sources in the country of silica sand for the production of glass and ceramics. Sand has been produced from this geologic horizon for nearly a century and is recognized the country over for its superior

quality and uniformity. The industry is continuing to strive for improved quality through selective mining of the glass sand and through new and improved processes of beneficiation to control the quality and grain size of the glass sands.

### Other Industrial Minerals

In the roofing granules industry, production in 1951 was higher than normal, but off slightly from the 1950 level. Production in 1952 is expected to be off approximately 10 per cent as a result of federal restrictions on building. Increasing transportation cost is a limiting factor in competitive market areas. There is a trend toward the greater use of pastel colors in the coating of roofing granules. Continual research and plant improvements are necessary for successful operation in this highly competitive field.

The sand and gravel industry reports no significant developments in Pennsylvania in 1951. Development of new sources of sand and gravel continued to pose a serious problem to the industry, for many of the more obvious deposits are worked out.

In the field of ceramic clays there was little or no activity. A reconnaissance investigation of a white clay deposit was conducted along the flanks of South Mountain in Cumberland County, but no further development work has resulted. At State College, a laboratory project indicated that siliceous white clays, such as are common in certain areas in Pennsylvania, can be up-graded successfully by flotation. Integrated field and laboratory studies of potential ceramic clays is much needed.

In 1948, pyrophyllite was discovered in the South Mountain area of Adams County at Gargol, Huntington Township. Subsequently attention was drawn to high-grade sericite schists, similar to the pyrophyllite in appearance but occurring much more widespread in the South Mountain area. Both the pyrophyllite and sericite are potentially important as insecticide diluents, fillers, and possibly for use in ceramics and refractories. The deposits have attracted wide attention, but development has been retarded because of lack of investment capital and well-organized investigation into the extent, character and uses of the material in the deposits under consideration. The Pennsylvania deposits are very favorably situated to compete with North Carolina pyrophyllite, having a freight advantage of more than \$10 per ton in the northern market areas. There are indications that development work carried on in the latter half of 1951 may result in actual production of sericite and possibly pyrophyllite in 1952. Detailed investigation of the geology of the volcanic rocks in the South Mountain area, with particular attention to pyrophyllite and sericite occurrences, was carried on during the summer of 1951 by the Topographic and Geologic Survey. Preliminary studies of the utilization of the two minerals is to be made by the School of Mineral Industries in 1952.

Production of mica schist for refractories was continued in Montgomery County during 1951. A mica deposit in northern Lancaster County, operated for a short period during World War II, was reopened for appraisal in the spring of 1951.

## Conclusion

Production of industrial minerals in Pennsylvania in 1951, with a few exceptions, presented a picture of healthy growth. Most of the adverse factors cited are due to the problems of the time—high costs and governmental restrictions. There is, however, one notable exception. Some of our more important non-metallic mineral industries, having mushroomed and flourished because of an abundance of rich raw materials, are feeling the pinch of dwindling reserves of suitable resources. These industries, while “living high on the hog,” in many instances have not been fully appreciative of the need for a thorough survey of their resources, consequently a lack of fundamental knowledge limits full utilization of the available raw materials.

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